

Autonomous Agents and Multiagent Systems

2007/2008

Lab 6 – Case Study - Auctions

1 Case Study: Auctions

As described in the theory lessons, [Wooldridge02, Cap. 7], there are several kinds of auctions. In this lab two shall be simulated. For this purpose, consider the following entities:

- **Representative**: participates in an auction representing some user which created it and specified a maximum value to offer for a particular item also defined on creation;
- **Auctioneer**: coordinates the auction, receiving offers and selling items to the representatives with the best offers. Furthermore, inform the representatives whether their offers have been accepted. In the *English* auction, is also responsible for informing representatives whose offers where surpassed, so that they can update their offers.

a) First-price sealed-bid auction

In this auction, interested parties make one (and final) offer during a specified time period. When time finishes, the auctioneer chooses the best offer (typically, with the highest value) which is paid accordingly.

Explore the base code and implement this auction.

The following (incomplete) classes are provided:

```
aasm.jade.firstPriceSealedBidAuction.Auctioneer  
aasm.jade.firstPriceSealedBidAuction.Representative
```

b) Yellow Pages

Note that the `getAuctioneers` method in the `Representative` class assumes that all auctioneers are “well known”.

JADE supports the Yellow Pages mechanism (*Directory Facilitator*, DF). Explore this mechanism and alter the classes accordingly so that auctioneers are dynamically selected through the DF.

c) English auction

This auction proceeds in several rounds. First, every interested party makes a proposal. Then, the auctioneer, when the round time expires, evaluates the proposals and informs the participants about the highest offer.

A new round follows, where participants, whose offer is not the highest, can, if they so desire, make a new offer.

This auction may end in three cases: (1) when no new offers are made in a new round, i.e., no one makes a better offer than the one in the previous round; (2) when, only one offer is made, being this automatically the winner; (3) when maximum number of rounds is exceeded (this value is passed as an argument to the agent).

The auctioneer may have a base price for the item, which should be advertised at the beginning of the auction.